

IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF DELAWARE

CORTEVA AGRISCIENCE LLC,	)	
	)	
Plaintiff,	)	
	)	
v.	)	C.A. No. 22-1046 (GBW)
	)	
MONSANTO COMPANY and BAYER	)	<b>DEMAND FOR JURY TRIAL</b>
CROPSCIENCE LP,	)	
	)	
Defendants.	)	

**ANSWER AND AFFIRMATIVE DEFENSES**

Defendants Monsanto Company and Bayer CropScience LP (collectively, “Defendants”), by their attorneys, answer the Complaint of Corteva Agriscience LLC (“Corteva”) as follows. Any allegations not expressly admitted are hereby denied, including but not limited to any headings. This Answer follows the numbering in Corteva’s Complaint.

**I. NATURE OF THE ACTION**

1. This is an action for infringement of United States Patent No. 10,947,555 (“the ’555 patent”) arising under the patent laws of the United States, 35 U.S.C. § 100 *et seq.*

**ANSWER:** The allegations of this paragraph set forth legal conclusions to which no response is required. To the extent any further response is required, Defendants deny that they are liable for infringement of the ’555 patent.

2. The ’555 patent is directed to Corteva’s invention of transgenic (genetically modified) plants and plant cells that produce AAD-1 enzymes conferring resistance to two different classes of herbicides with different modes of action: phenoxy auxin herbicides (e.g., 2,4-D) and (R)-aryloxyphenoxypropionate herbicides (e.g., quizalofop). Corteva’s invention, commercialized in Corteva’s Enlist® branded corn products, enables growers to use multiple types

of herbicides to control weeds, including glyphosate-resistant weeds that are resistant to Monsanto's glyphosate herbicide, Roundup®.

**ANSWER:** This paragraph purports to characterize the '555 patent, which speaks for itself. Defendants admit that Corteva has marketed a product referred to as "Enlist®." The remaining allegations in this paragraph are denied.

3. With knowledge of Corteva's invention, Defendants have made and used transgenic plants that produce an AAD-1 enzyme having dual activity against 2,4-D and quizalofop. Defendants have renamed such AAD-1 enzymes as "FT" enzymes. Defendants have filed at least one application with the U.S. Department of Agriculture seeking nonregulated status to permit marketing of transgenic plants producing an AAD-1 (FT) enzyme in the United States (i.e., MON 87429 maize).

**ANSWER:** Defendants admit that Monsanto Company submitted a request to APHIS for a determination of nonregulated status for the new biotechnology-derived maize product, MON 87429, any progeny derived from crosses between MON 87429 and conventional maize, and any progeny derived from crosses of MON 87429 with biotechnology-derived maize that have previously been granted nonregulated status under 7 CFR Part 340. Defendants deny the remaining allegations of this paragraph.

4. By making and using Corteva's patented transgenic plants in the United States, Defendants have infringed the '555 patent at least under 35 U.S.C. § 271(a).

**ANSWER:** Denied.

## **II. THE PARTIES**

5. Plaintiff Corteva Agriscience LLC is incorporated in Delaware with a place of business located at Chestnut Run Plaza, 974 Centre Road, Wilmington, Delaware 19805.

**ANSWER:** Upon information and belief, admitted.

6. Corteva is one of the world's largest commercial seed and plant producers. Corteva uses genetic research to develop crop plants designed to increase quantity, quality, and sustainability of yields for farmers, including herbicide-resistant transgenic maize hybrids and soybean varieties.

**ANSWER:** Defendants admit that Corteva is a producer of seeds and plants. Defendants lack knowledge or information sufficient to form a belief as to the truth of the remaining allegations of this paragraph, and therefore deny them.

7. Corteva has received numerous patents in the United States and in other countries for its innovative discoveries, including the '555 patent. Corteva owns, by valid assignment, all rights, title, and interest in the asserted '555 patent.

**ANSWER:** Defendants deny that the '555 patent represents an innovative discovery. Defendants lack knowledge or information sufficient to form a belief as to the truth of the remaining allegations of this paragraph, and therefore deny them.

8. Defendant Monsanto Company is incorporated under the laws of the State of Delaware. On information and belief, as reported in its filings with the United States Securities and Exchange Commission, Monsanto Company has a registered office at 251 Little Falls Drive, Wilmington, Delaware 19808-1674.

**ANSWER:** Defendant Monsanto Company admits that it is incorporated under the laws of the State of Delaware. The remaining allegations of this paragraph are denied.

9. Defendant Bayer CropScience LP is organized and existing under the laws of the State of Delaware. On information and belief, Bayer CropScience LP also has a registered office at 251 Little Falls Drive, Wilmington, Delaware 19808-1674.

**ANSWER:** Defendant Bayer CropScience LP admits that it is organized under the laws of the State of Delaware. The remaining allegations of this paragraph are denied.

10. On information and belief, Defendants Monsanto Company and Bayer CropScience LP are wholly owned by Bayer AG and part of its Crop Science Division. On information and belief, Defendants are engaged in developing, producing, and selling crop seeds and plants, including herbicide-resistant transgenic plants.

**ANSWER:** Defendants admit that Monsanto Company and Bayer CropScience LP are wholly owned by Bayer AG and part of its Crop Science Division. Defendants admit that Bayer CropScience LP is engaged in selling crop seeds and plants, including herbicide-resistant transgenic plants. The remaining allegations of this paragraph are denied.

### III. JURISDICTION AND VENUE

11. This action arises under the patent laws of the United States, 35 U.S.C. § 100 *et seq.* This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

**ANSWER:** The allegations of this paragraph set forth legal conclusions to which no response is required. To the extent any other response is required, Defendants admit Corteva purports to assert claims for patent infringement. Defendants lack knowledge or information sufficient to form a belief as to the truth of the remaining allegations of this paragraph, and therefore deny them.

12. This Court has personal jurisdiction over Monsanto Company and Bayer CropScience LP, which have purposefully availed themselves of the protections of this forum by incorporating in Delaware. Monsanto Company and Bayer CropScience LP have also availed themselves of the protections of this forum by filing actions in this Court. *See, e.g., Monsanto Co. v. Syngenta Seeds Inc.*, No. 1:04-cv-305 (D. Del.); *Monsanto Co. v. Mycogen Plant Sci., Inc.*, No. 1:96-cv-133 (D. Del.); *Monsanto Co. v. Pharmacia & Upjohn Co.*, No. 1:97-cv-537 (D. Del.); *Bayer CropScience LP v. United Indus. Corp.*, No. 1:03-cv-352 (D. Del.).

**ANSWER:** The allegations of this paragraph set forth legal conclusions to which no response is required. To the extent any further response is required, Defendants do not contest personal jurisdiction for purposes of this action.

13. Venue is proper in this Judicial District under 28 U.S.C. §§ 1391(b) and (c) and 1400(b), at least because Monsanto Company and Bayer CropScience LP are incorporated in Delaware and because Delaware is a convenient forum for resolution of the parties' disputes set forth herein.

**ANSWER:** The allegations of this paragraph set forth legal conclusions to which no response is required. To the extent any further response is required, Defendants do not contest venue for purposes of this action.

### IV. THE PATENT IN SUIT

14. The '555 patent, entitled "Herbicide Resistance Genes," was duly and legally issued by the United States Patent and Trademark Office ("USPTO") on March 16, 2021. The '555 patent identifies Terry Wright, Justin Lira, Donald Merlo, and Nicole Arnold as inventors. A true and correct copy of the '555 patent is attached as Exhibit A.

**ANSWER:** The allegations of this paragraph purport to characterize the '555 patent, which speaks for itself. To the extent any further response is required, denied.

15. The '555 patent issued from U.S. Appl. No. 15/288,406, which was filed on October 7, 2016, and published on January 26, 2017, as U.S. Appl. Publ. No. 2017/0022515. The '555 patent claims priority to U.S. Appl. No. 14/820,893, filed August 7, 2015 (now U.S. Patent No. 10,174,337); U.S. Appl. No. 12/951,813, filed November 22, 2010 (now U.S. Patent No. 9,127,289); U.S. Appl. No. 11/587,893, filed May 22, 2008 (now U.S. Patent No. 7,838,733); Patent Cooperation Treaty Appl. No. PCT/US2005/014737, filed May 2, 2005; and Provisional Appl. No. 60/567,052, filed April 30, 2004.

**ANSWER:** The allegations of this paragraph purport to characterize the '555 patent, which speaks for itself. To the extent any further response is required, denied.

16. The invention of the '555 patent relates to transgenic plants having resistance to at least two different classes of herbicides: phenoxy auxin herbicides such as 2,4-D and (R)-aryloxyphenoxypropionate herbicides such as quizalofop. The '555 patent's transgenic plants include novel maize and soybean lines. Maize (also known as corn) and soybeans are used as human food, livestock feed, industrial raw materials, and in biofuel production. Maize and soybeans are commercially important crops in the United States.

**ANSWER:** The first two sentences purport to characterize the '555 patent, which speaks for itself. To the extent any further response to the first two sentences is required, denied, including denied that the '555 patent constitutes an invention. Defendants admit the last two sentences of this paragraph.

17. As the '555 patent states, weeds can quickly deplete soil of valuable nutrients, posing a challenge for growers of maize, soybeans, and other crops. Ex. A at 1:21-29. To control weeds, growers have commonly used the herbicide glyphosate (e.g., Roundup®). *See id.* at 1:22-29. During the 1990s, Monsanto introduced genetically engineered Roundup Ready® transgenic crops having glyphosate tolerance so that growers could use glyphosate to control weeds while minimizing harm to their crops. *Id.* at 1:30-53. Glyphosate-tolerant transgenic crops were widely adopted, grown on over 80% of soybean acres and on over 20% of maize acres in the United States. *Id.* at 2:10-19. Over-reliance on glyphosate and glyphosate-tolerant crops, however, led to increasing prevalence of weeds having glyphosate resistance, including both broadleaf and grass weeds. *Id.* at 1:58-2:10.

**ANSWER:** The allegations of this paragraph purport to characterize the '555 patent, which speaks for itself. To the extent any further response is required, denied.

18. In areas where glyphosate-resistant weeds developed, growers could compensate for glyphosate's ineffectiveness by using other herbicides, such as 2,4-D. *Id.* at 2:20-31. But use of 2,4-D was limited due to the sensitivity of certain dicot crops, including soybeans, to this herbicide and due to injury it can cause in monocot crops, such as maize. *Id.* at 2:31-36.

**ANSWER:** The allegations of this paragraph purport to characterize the '555 patent, which speaks for itself. To the extent any further response is required, denied.

19. Corteva's invention, described in the '555 patent, enables growers to use multiple types of herbicides to control weeds, including glyphosate-resistant weeds. As the '555 patent discloses, the inventors' creation of transgenic plants expressing the bacterial  $\alpha$ -ketoglutarate dependent ("αKG") dioxygenase enzyme RdpA from *Sphingobium herbicidovorans* resulted in a surprising discovery: these novel transgenic plants exhibited dual activity against two different classes of herbicides with different modes of action. *Id.* at 19:34-63. These two classes are (R)-aryloxyphenoxypropionate herbicides (e.g., quizalofop), which target grass weeds, and phenoxy auxin herbicides (e.g., 2,4-D), which target broadleaf weeds. *Id.* at 19:64-20:3.

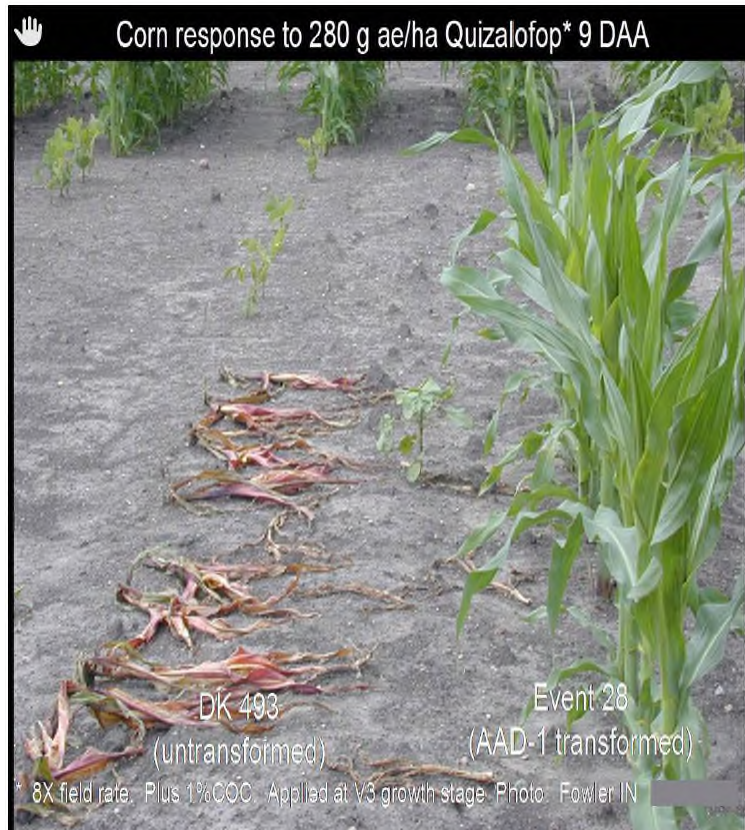
**ANSWER:** The allegations of this paragraph purport to characterize the '555 patent, which speaks for itself. To the extent any further response is required, denied, including denied that the '555 patent constitutes an invention or reflects a surprising discovery.

20. In light of this unique dual herbicide-tolerance activity, the enzymes and genes of the '555 patent are called "AAD-1" (AryloxyAlkanoate Dioxygenase) proteins and genes. *Id.* at 19:52-54, 4:32-46. The '555 patent discloses that AAD-1 proteins beneficially provide "tolerance to combinations of herbicides that would control nearly all broadleaf and grass weeds." *Id.* at 20:13-15. The '555 patent discloses that AAD-1 genes can be "stacked" with other herbicide resistance genes, including glyphosate-resistance genes, glufosinate-resistance genes, and others to confer resistance to additional herbicides. *Id.* at 17:53-57, 20:15-20.

**ANSWER:** The allegations of this paragraph purport to characterize the '555 patent, which speaks for itself. To the extent any further response is required, denied.

21. The '555 patent discloses novel transgenic plants and plant cells that comprise a polynucleotide encoding an AAD-1 protein. *Id.* at 18:50-58, 38:65-39:3. These transgenic plants and plant cells include maize and soybeans. *Id.* at 20:63-21:25, 80:10-95:37 (Examples 7-9 describing transgenic maize), 102:1-106:40 (Example 13 describing transgenic soybeans). The '555 patent reports that transgenic maize expressing an AAD-1 protein exhibits "robust field level resistance to 2,4-D and quizalofop," thus providing growers with new solutions for controlling weeds, including glyphosate-resistant weeds. *Id.* at 92:49-50. Figure 16 of the '555 patent, for example, depicts the field testing and quizalofop tolerance of transgenic maize expressing an AAD-1 protein as compared to control plants that do not express an AAD-1 protein:





*Id.* at Fig. 16.

**ANSWER:** The allegations of this paragraph purport to characterize the '555 patent, which speaks for itself. To the extent any further response is required, denied, including denied that the '555 patent constitutes an invention.

22. The claims of the '555 patent are generally directed to transgenic plants and plant cells comprising a polynucleotide encoding an AAD-1 protein defined by an amino acid sequence motif and 85% amino acid sequence identity to RdpA (i.e., SEQ ID NO: 9), as well as methods of controlling weeds. Claim 1, for example, recites:

1. A transgenic plant cell comprising a recombinant polynucleotide that encodes an AAD-1 protein that exhibits aryloxyalkanoate dioxygenase activity wherein said activity enzymatically degrades a phenoxy auxin herbicide and an (R)-aryloxyphenoxypropionate herbicide, further wherein said AAD-1 protein comprises:

- i) an amino acid sequence having at least 85% sequence identity with SEQ ID NO: 9; and
- ii) an AAD-1 motif having the general formula of:

$HX_{112}D(X)_{114-137}T(X)_{139-269}H(X)_{271-280}R$ , wherein

$X_{112}$  represents a single amino acid at position 112, relative to the sequence of SEQ ID NO: 9;

$(X)_{114-137}$  represents a sequence of 24 amino acids;

$(X)_{139-269}$  represents a sequence of 131 amino acids; and

$(X)_{271-280}$  represents a sequence of 10 amino acids.

**ANSWER:** The allegations of this paragraph purport to characterize the '555 patent, which speaks for itself. To the extent any further response is required, denied.

23. Dependent claim 6 of the '555 patent recites: "A transgenic plant comprising a plurality of the plant cells of claim 1, wherein expression of said polynucleotide renders said plant tolerant to an aryloxyalkanoate herbicide."

**ANSWER:** The allegations of this paragraph purport to characterize the '555 patent, which speaks for itself. To the extent any further response is required, denied.

24. Defendants have been aware of the '555 patent family disclosing Corteva's invention of transgenic plants and plant cells comprising a recombinant polynucleotide encoding an AAD-1 protein that has dual activity against 2,4-D and quizalofop herbicides. For example, Monsanto's U.S. Patent No. 7,855,326,<sup>1</sup> issued December 21, 2010, cites the WO 2005/107437 publication of Corteva's Patent Cooperation Treaty Appl. No. PCT/US2005/014737, to which the '555 patent claims priority. Monsanto has also cited other Corteva patents and publications within the '555 patent family, including U.S. Patent No. 7,838,733 and U.S. Patent No. 9,127,289, and the publications of U.S. Appl. No. 12/951,813 (US 2011/0124503) and U.S. Appl. No. 14/820,893 (US 2015/0344903). *See, e.g.*, Monsanto U.S. Patent No. 10,023,874.

**ANSWER:** The first sentence of this paragraph is denied. The second sentence of this paragraph purports to characterize U.S. Patent No. 7,855,326, WO 2005/107437, and the '555 patent, which speak for themselves. To the extent any further response to the second sentence is required, denied. The third and fourth sentences of this paragraph purport to characterize the '555 patent, U.S. Patent No. 7,838,733, U.S. Patent No. 9,127,289, U.S. Published Application

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<sup>1</sup> On information and belief, Defendant Monsanto Company is the parent of Monsanto Technology, LLC, the assignee of U.S. Patent No. 7,855,326.



No. 2011/0124503, U.S. Published Application No. 2015/0344903, and U.S. Patent No. 10,023,874, which speak for themselves. To the extent any further response to the third and fourth sentences is required, denied. Defendants admit that Monsanto Company is the parent of Monsanto Technology, LLC. The remaining allegations of this paragraph are denied.

25. On January 26, 2017, Corteva's application for the '555 patent published as U.S. Appl. Publ. No. 2017/0022515 (the "2017 publication"). The claims of Corteva's 2017 publication were directed to transgenic plants and plant cells encoding a dual-activity AAD-1 protein having the AAD-1 motif and 85% amino acid sequence identity to RdpA (i.e., SEQ ID NO: 9) and methods of controlling weeds.

**ANSWER:** The allegations of this paragraph purport to characterize the '555 patent and U.S. Appl. Publ. No. 2017/0022515, which speak for themselves. To the extent any further response is required, denied.

26. On information and belief, Defendants used their knowledge of Corteva's invention to make transgenic plants comprising a recombinant polynucleotide encoding dual-activity AAD-1 proteins. On March 3, 2019, Defendants published certain details of their activities in an article by Clayton T. Larue et al., Development of Enzymes for Robust Aryloxyphenoxypropionate and Synthetic Auxin Herbicide Tolerance Traits in Maize and Soybean Crops, 75(8) PEST MGMT. SCI. 2086-94 (2019) ("Larue," attached as Exhibit B).

**ANSWER:** The allegations in the first sentence of this paragraph are denied. Defendants admit that Exhibit B purports to be a copy of an article by Clayton T. Larue et al., titled "Development of enzymes for robust aryloxyphenoxypropionate and synthetic auxin herbicide tolerance traits in maize and soybean crops," Pest Manag Sci 2019; 75: 2086–2094 ("Larue"), which speaks for itself. To the extent any further response is required, denied.

27. In Larue, Defendants reported that they made transgenic maize and soybean plants that express RdpA-variant proteins exhibiting dual activity against 2,4-D and quizalofop herbicides. Ex. B at 2086-87. In explaining their rationale for working with RdpA, Defendants cited an AAD-1 publication by Corteva inventor Terry Wright and his colleagues. *Id.* at 2087, 2094 (citing ref. 9: T.R. Wright et al., Robust Crop Resistance to Broadleaf and Grass Herbicides Provided by Aryloxyalkanoate Dioxygenase Transgenes, 107 PROC. NAT'L ACAD. SCI. USA 20240-45 (2010)). Rather than using Corteva's AAD-1 name, Defendants renamed the RdpA homologues as "FT" enzymes (e.g., FT\_T and FT\_Tv7 enzymes). *Id.* at 2087, 2090, 2092-94.

**ANSWER:** The allegations of this paragraph purport to characterize Larue and 107 PROC. NAT'L ACAD. SCI. USA 20240-45 (2010), which speak for themselves. To the extent any further response is required, denied.

28. In Larue, Defendants described their field trials using transgenic maize plants expressing an FT\_T protein. Defendants reported that the transgenic maize plants exhibited dual herbicide resistance against quizalofop and 2,4-D as compared to control maize plants that did not express an FT\_T protein. *Id.* at 2092-94. Those field tests were performed in Illinois. *Id.* at 2088.



Control FT\_T  
Treatment: 16x QFOP (1440 g/ha) at both V2 and V4 growth stages.



Control FT\_T  
Treatment: 16x 2,4-D (18000 g/ha) at both V2 and V4 growth stages.

*Id.* at 2090 (Fig. 3(b) and 3(d)), 2093 (“In the treatments with QFOP [quizalofop], the control plants were completely killed while . . . [plants expressing FT\_T] showed little injury . . . . In treatments with 2,4-D, a similar trend as with QFOP was observed . . .”).

**ANSWER:** The allegations of this paragraph purport to characterize Larue, which speaks for itself. To the extent any further response is required, denied.

29. Defendants also reported in Larue that they transformed a “commercially relevant soybean line” to express FT\_T and other FT proteins (FT\_Tv7 and FT\_Tv3) having dual activity against a synthetic auxin herbicide such as 2,4-D and an aryloxyphenoxypropionate (“FOP”) herbicide such as quizalofop. *Id.* at 2094. Defendants reported that these FT proteins exhibited “FOP activity . . . suitable for robust in-plant tolerance” and “demonstrated 2,4-D tolerance in soybean [plants].” *Id.* at 2092, 2094, 2092 (Table 1), 2093 (Fig. 6). Defendants also reported that, in particular, transgenic soybean plants expressing the FT\_Tv7 protein showed “commercially relevant” 2,4-D tolerance in field applications. *Id.* at 2094.

**ANSWER:** The allegations of this paragraph purport to characterize Larue, which speaks for itself. To the extent any further response is required, denied.

30. Defendants reported in Larue that the amino acid sequences of the FT\_T and FT\_Tv7 proteins were published in GenBank with the accession numbers MH043112 and MH043115, respectively. *Id.* at 2088.

**ANSWER:** The allegations of this paragraph purport to characterize Larue, which speaks for itself. To the extent any further response is required, denied.

31. On information and belief, the FT\_T protein's amino acid sequence has at least 85% sequence identity with SEQ ID NO: 9 recited in the '555 patent claims. On information and belief, the FT\_T protein also has the AAD-1 motif as annotated below.

**GenBank Accession No. MH043112 (FT\_T Sequence)**

```
MHAALTPLTNKYRFIDVQPLTGVLGAEITGVDLREPLDDSTWNEILDAFHTYQVIYFPGQAITNEQHIAFSRRF
GPVDPVPILKSIEGYPEVQIMIRREANESSRFIGDDWHTSTFLDAPPAAVVMRAIEVPEYGGDTGFLSMYSAWE
TLSPTMQATIEGLNVVHSATKVFGSLYQATNWRFSNTSVKVMVDVAGDRETVHPLVVTHPVTGRRALYCNQVYC
QKIQGMTDAESKSLQFLYEHATKFDFTCRVRWKKDQVLVWDNLCTMHRAVPDYAGKFYLTTRTTVAGDKPSR
```

HX<sub>112</sub>D(X)<sub>114-137</sub>T(X)<sub>139-269</sub>H(X)<sub>271-280</sub>R

**FIGURE 1**

Ex. C (annotations added).

**ANSWER:** The allegations of this paragraph purport to characterize Exhibit C, which speaks for itself. The allegations of the paragraph also purport to interpret and apply the language of the claims of the '555 patent, and as such set forth legal conclusions to which no response is required. To the extent any further response is required, denied.

32. On information and belief, the FT\_Tv7 protein's amino acid sequence has at least 85% sequence identity with SEQ ID NO: 9 recited in the '555 patent claims. On information and belief, the FT\_Tv7 protein also has the AAD-1 motif as annotated below.

**GenBank Accession No. MH043115 (FT\_Tv7 Sequence)**

```
MHAALTPLTNKYRFIDVQPLTGVLGAEITGVDLREPLDDSTWNEILDAFHTYQVIYFPGQAITNEQHIAFSRRF
GPVDPVPILKSIEGYPEVQIMIRREANESSRYIGDDWHAHSTFLDAPPAAVVMRAIEVPEYGGDTGFLSMYSAWE
TLSPTMQATIEGLNVVHSATKVFGSLYQATNWRFSNTSVKVMVDVAGDRETVHPLVVTHPVTGRRALYCNQVYC
QKIQGMTDAESKSLQFLYEHATQFDFTCRVRWKKDQVLVWDNLCTMHRAVPDYAGKFYLTTRTTVAGDKPSR
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HX<sub>112</sub>D(X)<sub>114-137</sub>T(X)<sub>139-269</sub>H(X)<sub>271-280</sub>R

**FIGURE 2**

Ex. D (annotations added).

**ANSWER:** The allegations of this paragraph purport to characterize Exhibit D, which speaks for itself. The allegations of the paragraph also purport to interpret and apply the language of the claims of the '555 patent, and as such set forth legal conclusions to which no response is required. To the extent any further response is required, denied

33. Shortly after publishing Larue, Defendants submitted a Petition to the Animal and Plant Health Inspection Service of the U.S. Department of Agriculture ("APHIS Petition," attached as Exhibit E) on June 27, 2019. On information and belief, Defendants' APHIS Petition requests a determination of nonregulated status to permit marketing of maize containing the MON 87429 transgenic event, which encodes the dual-activity FT\_T protein Defendants previously described in Larue. Ex. E at 25, 85 ("The FT\_T protein produced in MON 87429 is encoded by the *ft\_t* gene . . .").<sup>2</sup>

**ANSWER:** Defendants admit, that on its face, Exhibit E purports to be a copy of a petition numbered CR279-19U4 and dated "June 27, 2019 (Revised December 10, 2019)" ("APHIS Petition"), a document which speaks for itself. The allegations of this paragraph also purport to characterize Larue, which speaks for itself. To the extent any further response is required, denied.

34. In the APHIS Petition, Defendants again report that the FT\_T protein exhibits the AAD-1 dual activity of degrading a phenoxy auxin herbicide (e.g., 2,4-D) and an (R)-aryloxyphenoxypropionate herbicide (e.g., quizalofop). For example, Defendants state that the FT\_T protein degrades quizalofop and 2,4-D into "herbicidally-inactive" compounds. *Id.* at 86; *see also id.* at 43 ("[The] FT\_T protein confers tolerance to quizalofop and 2,4-D herbicides.").

**ANSWER:** The allegations of this paragraph purport to characterize the APHIS Petition, which speaks for itself. To the extent any further response is required, denied.

35. On information and belief, Defendants' APHIS Petition illustrates that the FT\_T protein comprises an amino acid sequence having at least 85% sequence identity with SEQ ID NO: 9 (i.e., the sequence of RdpA) recited in the '555 patent claims. Defendants reported in

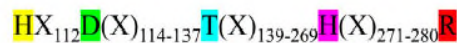
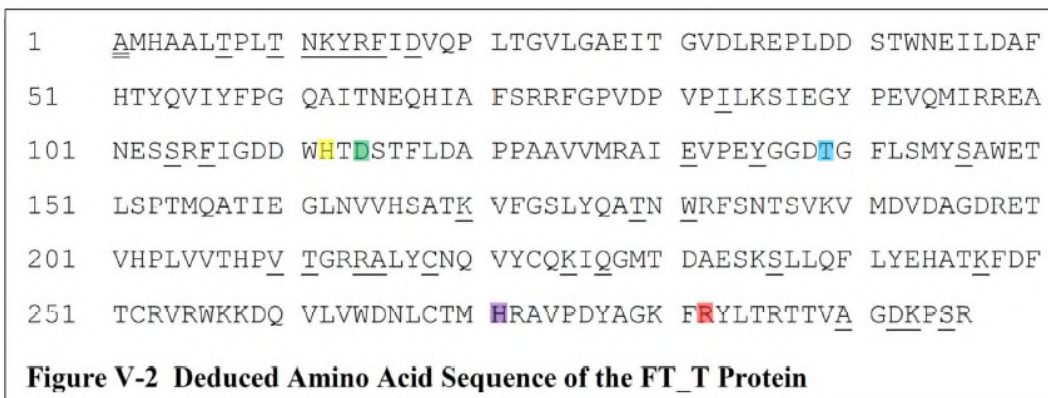
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<sup>2</sup> The *ft\_t* gene may be stacked with other genes encoding proteins conferring resistance to five or more different herbicides. Ex. E at 25 (APHIS Petition: "The flexibility to use dicamba, glufosinate, quizalofop, 2,4-D and glyphosate and/or combinations of these five herbicides . . . will provide an effective weed management system for maize production.").

the APHIS Petition that the “amino acid sequence of the FT\_T protein shares ~ 89% sequence identity with wild type RdpA.” *Id.* at 85.

**ANSWER:** The allegations of this paragraph purport to characterize the APHIS Petition, which speaks for itself. The allegations in this paragraph also purport to interpret and apply the language of the claims of the '555 patent, and as such set forth legal conclusions to which no response is required. To the extent any further response is required, denied.

36. Defendants' APHIS Petition also illustrates that the FT\_T protein comprises the structural AAD-1 motif  $\text{HX}_{112}\text{D(X)}_{114-137}\text{T(X)}_{139-269}\text{H(X)}_{271-280}\text{R}$  recited in the '555 patent claims. In the APHIS Petition, Defendants disclose the amino acid sequence of the FT\_T protein, which on information and belief contains the AAD-1 motif as annotated below.



**FIGURE 3**

See Ex. E at 86 (Fig. V-2) (color annotations added).

**ANSWER:** The allegations of this paragraph purport to characterize the APHIS Petition, which speaks for itself. The allegations in this paragraph also purport to interpret and apply the language of the claims of the '555 patent, and as such set forth legal conclusions to which no response is required. To the extent any further response is required, denied.

37. On information and belief, since the '555 patent issued on March 16, 2021, Defendants have continued making and using transgenic plants and plant cells having genes that encode dual-activity FT proteins in the United States. On April 28, 2021, for example, an article reported updates on Defendants' APHIS Petition for MON 87429 maize (also called “HT4” maize)



and Defendants' continuing development efforts. Emily Unglesbee, Five-Herbicide Corn Tech: Bayer's Future Five-Way Herbicide-Tolerant Corn Under Review by USDA, PROGRESSIVE FARMER DTN (Apr. 28, 2021), *available at* <https://www.dtnpf.com/agriculture/web/ag/crops/article/2021/04/28/bayers-future-five-way-herbicide> (attached as Exhibit F). It states that "Bayer is developing a corn technology that would tolerate in-season applications of five herbicides -- dicamba, 2,4-D, glufosinate, glyphosate and quizalofop." *Id.* It further states that "Bayer has been working on this new, five-way traited corn, which it calls HT4, and is re-focusing much of its research efforts there." *Id.* The article quoted Defendants as stating that "we . . . are focusing our resources on our fourth generation herbicide-tolerant corn (HT4) product." *Id.* The article also quoted Defendants as having paused work on an earlier generation maize product (HT3) in favor of focusing their resources on HT4 maize. *Id.* On information and belief, Defendants' APHIS Petition currently remains pending at the U.S. Department of Agriculture and has not been withdrawn.

**ANSWER:** The allegations in the first sentence of this paragraph purport to interpret and apply the claims of the '555 patent, and as such set forth legal conclusions to which no response is required. To the extent any further response to the first sentence is required, denied. The allegations in sentences 2-4 of this paragraph purport to quote and characterize Exhibit F, which speaks for itself. To the extent any further response to the allegations in sentences 2-4 is required, denied. Defendants admit that the APHIS Petition currently remains pending at the U.S. Department of Agriculture and has not been withdrawn.

### **COUNT I: INFRINGEMENT OF THE '555 PATENT**

38. Corteva repeats and realleges each of the foregoing paragraphs as if fully set forth herein.

**ANSWER:** Defendants restate and incorporate by reference each of the foregoing responses as if fully set forth herein.

39. On information and belief, after issuance of the '555 patent, Defendants have infringed at least claims 1 and 6 of the '555 patent under 35 U.S.C. § 271(a), either literally or under the doctrine of equivalents, by making and using claimed transgenic plants and plant cells comprising a recombinant polynucleotide encoding a dual-activity AAD-1 protein without authority in the United States.

**ANSWER:** Denied.



40. On information and belief, Defendants have made and used transgenic plant cells comprising a recombinant polynucleotide that encodes an AAD-1 protein, as required by claim 1 of the '555 patent. For example, on information and belief, Defendants' HT4 (MON 87429) maize plants contain transgenic maize cells comprising a recombinant *ft\_t* gene that encodes an AAD-1 protein, renamed by Defendants as an "FT" protein, specifically "FT\_T." Ex. E at 85 ("The FT\_T protein produced in MON 87429 is encoded by the *ft\_t* gene . . ."); Ex. B at 2087-88, 2093; Ex. F.

**ANSWER:** Denied.

41. On information and belief, the encoded FT\_T protein exhibits aryloxyalkanoate dioxygenase activity in which the activity enzymatically degrades a phenoxy auxin herbicide and an (R)-aryloxyphenoxypropionate herbicide, as required by claim 1 of the '555 patent. On information and belief, the FT\_T protein has the AAD-1 dual activity of enzymatically degrading 2,4-D (a phenoxy auxin herbicide) and quizalofop (an (R)-aryloxyphenoxypropionate herbicide) into "herbicidally-inactive" compounds. Ex. E at 85, 86, 43 ("[The] FT\_T protein confers tolerance to quizalofop and 2,4-D herbicides."); Ex. B at 2093.

**ANSWER:** The allegations of this paragraph purport to interpret and apply the claims of the '555 patent, and as such set forth legal conclusions to which no response is required.

To the extent any further response is required, denied.

42. On information and belief, the encoded FT\_T protein comprises an amino acid sequence having at least 85% sequence identity with SEQ ID NO: 9, as required by claim 1 of the '555 patent. Ex. E at 85 ("The amino acid sequence of the FT\_T protein shares ~ 89% sequence identity with wild type RdpA . . .").

**ANSWER:** The allegations of this paragraph purport to interpret and apply the claims of the '555 patent, and as such set forth legal conclusions to which no response is required.

To the extent any further response is required, denied.

43. On information and belief, the encoded FT\_T protein also comprises an AAD-1 motif having the general formula  $HX_{112}D(X)_{114-137}T(X)_{139-269}H(X)_{271-280}R$  relative to the sequence of SEQ ID NO: 9, as required by claim 1 of the '555 patent. *See supra* Figs. 1, 3.

**ANSWER:** The allegations of this paragraph purport to interpret and apply the claims of the '555 patent, and as such set forth legal conclusions to which no response is required.

To the extent any further response is required, denied.

44. On information and belief, Defendants have made and used a transgenic plant comprising a plurality of the plant cells of claim 1, in which expression of the recombinant

polynucleotide renders the plant tolerant to an aryloxyalkanoate herbicide, as required by claim 6 of the '555 patent. On information and belief, expression of the *ft\_t* gene of Defendants' transgenic plants produces the FT\_T protein, rendering the transgenic plants tolerant to an aryloxyalkanoate herbicide, such as quizalofop or 2,4-D. Ex. E at 4 (“[T]he *ft\_t* gene . . . expresses a FOPs and 2,4-D dioxygenase protein (FT\_T) that confers tolerance to quizalofop and 2,4-D herbicides.”); *id.* at 85 (“The FT\_T protein produced in MON 87429 is encoded by the *ft\_t* gene that provides tolerance to aryloxyalkanoate herbicides.”), 43, 86; Ex. B at 2093-94.

**ANSWER:** Denied.

### **PRAYER FOR RELIEF**

The paragraphs under the heading “Prayer for Relief” contain legal conclusions to which no response is required. To the extent a response is required, Defendants deny the allegations in the paragraphs under the heading “Prayer for Relief” and deny that Corteva is entitled to any relief whatsoever.

### **DEMAND FOR JURY TRIAL**

The paragraph under the heading “Demand for Jury Trial” sets forth legal conclusions to which no response is required.

### **AFFIRMATIVE AND OTHER DEFENSES**

As separate defenses to the allegations of paragraphs 1 through 44 of Corteva's Complaint, Defendants assert the following affirmative and other defenses. Defendants do not intend hereby to assume the burden of proof as to those matters on which, pursuant to law, Corteva bears the burden.

#### **FIRST DEFENSE** **(Invalidity of the '555 Patent)**

The claims of the '555 patent are invalid for failure to comply with one or more of the requirements for patentability set forth in Title 35 of the United States Code, including 35 U.S.C. §§ 101, 102, 103, and/or 112, and/or the doctrine of obviousness-type double patenting.

**SECOND DEFENSE**  
**(Non-infringement of the '555 Patent)**

Any making, use, offer for sale, sale, and/or importation of plant cells, seeds, or plants containing MON 87429 has not infringed, does not infringe, and will not infringe any valid claim of the '555 patent.

**THIRD DEFENSE**  
**(No Willful Infringement)**

Corteva is not entitled to seek enhanced damages or attorneys' fees for willful and deliberate infringement.

**FOURTH DEFENSE**  
**(Failure to State a Claim)**

Corteva's Complaint fails to state a claim upon which relief can be granted.

**FIFTH DEFENSE**  
**(Lack of Standing)**

Corteva lacks standing to assert the '555 patent.

**SIXTH DEFENSE**  
**(35 U.S.C. § 287)**

To the extent Corteva and/or any predecessors-in-interest to rights and title in the '555 patent failed to comply with 35 U.S.C. § 287, including by failing to properly mark relevant products or otherwise give proper notice, Defendants are not liable to Corteva for the acts alleged to have been performed by Defendants before Defendants received actual notice that they were allegedly infringing the '555 patent.

**SEVENTH DEFENSE**  
**(Patent Misuse)**

Corteva's claims for infringement are barred by the doctrine of patent misuse.

**EIGHTH DEFENSE**  
**(Unclean Hands)**

Corteva's claims for infringement are barred by the doctrine of unclean hands.

**NINTH DEFENSE**  
**(No Exceptional Case)**

Defendants' actions in defending against Corteva's claims do not give rise to an exceptional case under 35 U.S.C. § 285.

\* \* \*

WHEREFORE, Defendants Monsanto Company and Bayer CropScience respectfully request the following relief:

- a. A judgment dismissing with prejudice Corteva's Complaint and each Request for Relief therein;
- b. A declaration that this is an exceptional case and an award of Defendants' attorneys' fees pursuant to 35 U.S.C. § 285;
- c. An award to Defendants of their costs and expenses in this action; and
- d. Such further and additional relief as this Court deems just and proper.

MORRIS, NICHOLS, ARSHT & TUNNELL LLP

*/s/ Rodger D. Smith II*

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September 30, 2022

*Attorneys for Defendants Monsanto Company  
and Bayer CropScience LP*

**CERTIFICATE OF SERVICE**

I hereby certify that on September 30, 2022, I caused the foregoing to be electronically filed with the Clerk of the Court using CM/ECF, which will send notification of such filing to all registered participants.

I further certify that I caused copies of the foregoing document to be served on September 30, 2022, upon the following in the manner indicated:

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